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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,200	07/11/2001	Christopher S. Chen	56252	1223
21874	7590	12/04/2003	EXAMINER	
EDWARDS & ANGELL, LLP			NAFF, DAVID M	
P.O. BOX 9169			ART UNIT	
BOSTON, MA 02209			PAPER NUMBER	

1651

DATE MAILED: 12/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

SM.

Office Action Summary	Application No.	Applicant(s)	
	09/904,200	CHEN ET AL.	
	Examiner	Art Unit	
	David M. Naff	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 64-92 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 64-92 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

The amendment of 8/18/03 amended claims 64, 85, 89 and 90, and added new claims 91 and 92.

Claims examined on the merits are 64-92, which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

Claims 64-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singhvi et al (6,368,838 B1) in view of Dewez et al (WO 96/15223) for reasons in the previous office action of 4/14/03.

The claims are drawn to a device containing a substrate having thereon a plurality of cytophilic regions that can adhere biomolecules and cytophobic regions to which the biomolecules do not adhere, and the cytophobic regions contain a surfactant compound. The substrate can be polymeric or hydrophobic.

Singhvi et al disclose a device having cytophilic islands for adhering cells and cytophobic regions which isolate the cytophilic islands. The cytophilic islands may contain extracellular matrix proteins (col 9, lines 32-33) to promote binding of cells (col 9, lines 22-26).

Dewez et al disclose a biomaterial for selective adhesion of cells or tissue which contains a polymeric support having a heterogeneous surface conditioned with a surfactant and an

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extracellular matrix protein. The extracellular matrix protein adheres to one surface area of the support and the surfactant adheres to another surface area where it inhibits adsorption of the extracellular matrix protein (paragraph bridging pages 3 and 4). Cells preferentially adhere to the portion of the support containing the extracellular matrix protein (page 4, lines 12-16).

It would have been obvious to provide the cytophilic islands of the device of Singhvi et al with extracellular matrix protein to enhance the binding of cells as suggested by Singhvi et al and Dewez et al, and it would have been obvious to provide the cytophobic regions of Singhvi et al with a surfactant to inhibit binding of extracellular matrix protein to these regions as suggested by Dewez et al. The conditions of dependent claims would have been matters of obvious choice within the skill of the art in view of the disclosures of the references. The surfactant of Dewez et al can be a polyethylene oxide (page 19, 5). Selecting another known surfactant that provides the same function would have been obvious. The devices of Singhvi et al and Dewez et al can have various forms and shapes and to provide channels as claimed by claims 81 and 82 would have been obvious. As to claims 91 and 92, the surface of Singhvi et al can be made of plastic or polysulfone compounds (col 8, lines 44-45).

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Polysulfones are hydrophobic. Selecting other polymers that provide the same function would have been obvious.

Response to Arguments

Applicant's arguments filed 8/18/03 have been fully considered but they are not persuasive.

Applicants urge that in Singhvi et al cytophobic regions are created by SAMs, and does not suggest the use of a surfactant to create a cytophobic region. However, it would have been obvious to adsorb a surfactant on a cytophobic SAM in a similar way that Dewez et al adsorb a surfactant on a hydrophobic surface. Moreover, it would have been obvious to use a surfactant to form a cytophobic SAM since Dewez et al disclose (page 5, lines 16-19) that the surfactant can contain a polyethylene oxide group and Singhvi et al disclose that a biophobic SAM can contain a polyethylene glycol group (col 9, line 60).

Applicants urge that Dewez et al use plasma treatment and do not disclose using a surfactant with an untreated surface. However, the surfactant would have been expected to absorb to other surfaces, and groups disclosed by Singhvi et al (col 9) for a SAM forming compound would have been expected to adsorb a surfactant.

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Applicants urge that Dewez et al provide no motivation. However, Dewez et al disclose that some cells remained on a hydrophobic track. It appears this could occur with the hydrophobic SAM of Singhvi et al, and it would have been obvious to use a surfactant to prevent this phenomena.

Applicants urge that SAMs require a metal substrate, and not a hydrophobic substrate. However, as noted above, Singhvi et al disclose that the surface can be formed of a plastic or polysulfone compound. It is clear from Singhvi et al that plasma treatment is not essential to forming a hydrophilic surface. Furthermore, the present claims do not exclude plasma treatment. Claims 91 and 92 do not require microfluidic channels as stated by applicants. As to claims 81 and 82, the channels of these claims do not have to be made of a polymer, or be hydrophobic. Singhvi et al disclose various shapes and patterns, and to provide a microfluidic channel would have been obvious for continuous passage of a fluid over cells contained by the device.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 703-308-0520. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 703-308-4743. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

A handwritten signature in black ink, appearing to read 'David M. Naff', with a stylized flourish at the end.

David M. Naff
Primary Examiner
Art Unit 1651

DMN

12/1/03